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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Daniel E. Resasco, Boonyarach Kitiyanan,  
Jeffrey H. Harwell and Walter Alvarez

Serial No.: Not Yet Assigned                      Atty. Dkt. No.: 5820.645

Filed: Herewith                                      Art Unit: 1754

For: METALLIC CATALYTIC PARTICLE                      Examiner: S. Hendrickson  
FOR PRODUCING SINGLE-WALLED  
CARBON NANOTUBES (AS AMENDED)

MS Patent Application  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

List of Sections Forming Part of This  
Information Disclosure Statement

The following sections are being submitted for this  
Information Disclosure Statement:

1.    ☒ Preliminary Statements
2.    ☒ Form PTO-1449 (Modified)
3.    ☐ Statement as to Information Not Found in  
         Patents or Publications (Information Not  
         Listed in Form PTO-1449 (Modified))
4.    ☒ Identification of Prior Application in Which  
         Listed Information Was Already Cited and for  
         Which No Copies Are Submitted or Need Be  
         Submitted
5.    ☒ Copies of Listed Information Items  
         Accompanying this Statement
6.    ☒ Identification of Person(s) Making this  
         Information Disclosure Statement

## **Section 1. Preliminary Statements**

Applicants submit herewith patents, publications or other information of which they are aware, which they believe may be material to the examination of this application and in respect of which there may be a duty to disclose.

The filing of this information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability or that no other material information exists.

The filing of this information disclosure statement shall not be construed as an admission against interest in any manner. Notice of January 9, 1992, 1135 O.G. 13-25, at 25.

## **Section 2. Form PTO-1449 (Modified)**

☒ [X] A completed Form 1449 (Modified) is attached hereto.

☐ [ ] No Form 1449 (Modified) is attached.

## **Section 3. Statement as to Information Not Found in Patents or Publications (Information Not Listed in Form PTO-1449)**

## **Section 4. Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted**

This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application Serial No. 09/988,847, filed on November 19, 2001.

The references were submitted to, and/or cited by, the Office in the prior application(s) are not required to be provided in this application; however, the prior art references listed below were not cited previously in the prior application(s) and copies are provided herewith:

**U.S. Patent Documents:** 6,413,487

**Other Materials:**

DB-ANDERSON et al.; DE- BOWER et al.; DG-CADEK et al.; DK-CHEN et al.; EE-DENG et al.; EG-FRANCO et al.; EH-GASPAR et al.; EI-GONG et al.; EL-HAMON et al.; FB-HWANG et al.; FG-JIN et al.; FK-LANDFESTER et al.; FL-LANDFESTER,; GA-LANDFESTER,; GC-McCARTHY et al.; GD-NIYOGI et al.; GE-POMPEO et al.; GF-RAZAVI; GI-SEARS et al.; GJ-THESS et al.; GL-TIARKS et al.; HA-TIARKS et al.; HD-ZHAO et al.; and HE-ZHU et al.

**Section 5. Copies of Listed Information Items Accompanying this Statement**

Legible copies of all items listed in Form PTO-1449 (Modified) accompany this information disclosure statement.

☒ Exception(s) to above:

☐ Items in prior application from which an earlier filing date is claimed for this application, as identified in Section 4.

**Section 6. Identification of Person(s) Making this INFORMATION DISCLOSURE STATEMENT**

The person making this statement is the attorney who signs below on the basis of the information:

☐ supplied by the inventor(s)

☐ supplied by an individual associated with the filing and prosecution of this application (37 C.F.R. § 1.56(c)).

☒ in the attorney's file

Respectfully submitted,



Christopher W. Corbett, Reg. No. 36,109  
DUNLAP, CODDING & ROGERS, P.C.  
P.O. Box 16370  
Oklahoma City, Oklahoma 73111  
(405) 607-8600 - telephone  
(405) 607-8686 - telefax  
Agent for Applicants

Express Mail: EL984538975US  
 Date Deposited: January 8, 2004

Substitute for form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Herewith
First Named Inventor	Daniel E. Resasco et al.
Group Art Unit	1754
Examiner Name	S. Hendrickson
Attorney Docket Number	5820.645

(use as many sheets as necessary)

## U. S. PATENT DOCUMENTS

EXAM INIT.	Cite No. 1	U.S. PATENT NUMBER Number	Kind Code <sup>2</sup> (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD- YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	AA	3746657		Miller et al.	07/17/1973	
	AB	4456694		Blaskie et al.	06/26/1984	
	AC	4574120		Thompson	03/04/1996	
	AD	4663230		Tennent	05/05/1987	
	AE	5165909		Tennent et al.	11/24/1992	
	AF	5227038		Smalley et al.	07/13/1993	
	AG	5300203		Smalley	04/05/1994	
	AH	5405996		Suzuki et al.	04/11/1995	
	AI	5482601		Ohshima et al.	01/09/1996	
	AJ	5543378		Wang	08/06/1996	
	AK	5556517		Smalley	09/17/1996	
	AL	5560898		Uchida et al.	10/01/1996	
	AM	5578543		Tennent et al.	11/26/1996	
	AN	5587141		Ohshima et al.	12/24/1996	
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	BA	5603907		Grochowski	02/18/1997	

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EXAM INIT.	Cite No. 1	U.S. PATENT NUMBER Number	Kind Code <sup>2</sup> (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD- YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	BB	5648056		Tanaka	07/15/1997	
	BC	5641466		Ebbesen et al.	06/24/1997	
	BD	5695734		Ikazaki et al.	12/09/1997	
	BE	5698175		Hiura et al.	12/16/1997	
	BF	5707916		Snyder et al.	01/13/1998	
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	BI	5773834		Yamamoto et al.	06/30/1998	
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	BN	5985232		Howard et al.	11/16/1999	
	BO	5997832		Lieber et al.	12/07/1999	
	BP	6333016		Resasco et al.	12/25/2001	
	BQ	6413487		Resasco et al.	07/02/2002	

## FOREIGN PATENT DOCUMENTS

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		Office 3 known)	Number 4	Kind Code5 (if				
	CA		PCT/US00/15362		International Search Report	10/17/2000		

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		Office 3 known)	Number 4	Kind Code5 (if				
	CB		PCT/US02/23155		International Search Report	07/21/2003		
	CC		WO 97/09272		PCT/US	03/13/1997		
	CD		WO 98/39250		PCT/US	09/11/1998		
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	CF		WO 98/42620		PCT/JP	10/01/1998		A
	CG		WO 00/17102		PCT International Publication	03/30/2000		
	CH		406122489		Japan	05/1994		X

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## NON PATENT DOCUMENTS

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EXAM INIT.		
	DA	ALVAREZ, ET AL., "Synergism of Co and Mo in the catalytic production of single-wall carbon nanotubes by decomposition of CO", <i>Elsevier Science Ltd.</i> , Carbon 39 (2001), pp. 547-558.
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	DE	BOWER et al., "Deformation of Carbon Nanotubes in Nanotube-Polymer Composites", Applied Physics Letters, vol. 74, no. 22, pp. 3317-3319, 05/31/1999.
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	EB	DAI et al., "Single-Wall Nanotubes Produced By Metal-Catalyzed Disproportionation of Carbon Monoxide", Chemical Physics Letters, vol. 260, pp. 471-475, 09/27/1996.
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	FC	HYPERION CATALYSIS INTERNATIONAL Website; <a href="http://www.fibrils.com/esd.htm">http://www.fibrils.com/esd.htm</a> ;"Unique Slough Resistant SR™ Series ESD Thermoplastic Product Line Offers Reduced Particle Contamination For Demanding Electronic Applications," and Hyperion Homepage <a href="http://www.fibrils.com">http://www.fibrils.com</a> .
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	FK	LANDFESTER et al., "Miniemulsion polymerization", 6/4/2003, <a href="http://www.mpikg-golm.mpg.de/kc/landfester/">http://www.mpikg-golm.mpg.de/kc/landfester/</a> , 1-22
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	GC	McCARTHY et al., "A Microscopic and Spectroscopic Study of Interactions between Carbon Nanotubes and a Conjugated Polymer", J. Phys. Chem. B, vol. 106, pp. 2210-2216, 2001.
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	GK	THESS et al., "Crystalline Ropes of Metallic Carbon Nanotubes", Science, vol. 273, pp. 483-487, 07/26/1996.
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	HB	WILLEMS et al., "Control of the outer diameter of thin carbon nanotubes synthesized by catalytic decomposition of hydrocarbons", Chemical physics Letters, vol. 317, pp. 71-76, 01/28/2000.
	HC	Yakobson et al.; "Fullerene Nanotubes: C <sub>1,000,000</sub> and Beyond," American Scientist, vol. 85, pp. 324-337, Jul-Aug 1997.
	HD	ZHAO, et al., "Chromatographic Purification and Properties of Soluble Single-Walled Carbon Nanotubes", American Chemical Society, Page Est: 4.1, pp. A-E, 02/22/2001.
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	HF	US 20020165091 A1, Resasco et al., Publication Date 11/07/2002.
	HG	US 20020127169 A1, Smalley et al., Publication Date 09/12/2002.
	HH	US 20010031900 A1, Margrave et al., Publication Date 10/18/2001.
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